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GenCore version 5.1.6  
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OM nucleic - nucleic search, using sw model

Run on: June 17, 2003, 11:16:03 ; Search time 221.672 Seconds  
(without alignments)  
10331.847 Million cell updates/sec

Title: US-09-807-933B-8

Perfect score: 1017  
Sequence: 1 atgaagtcacccgtgtctat.....caggtcgaagaagtaaa 1017

Scoring table: IDENTITY NUC  
Gapop 10.0, Gapext 1.0

Searched: 2185239 seqs, 112599159 residues

Total number of hits satisfying chosen parameters: 4370478

Minimum DB seq length: 0

Maximum DB seq length: 2000000000

Post-processing: Minimum Match 0%

Maximum Match 100%  
Listing first 45 summaries

Database :

N\_Geneseq\_101002:\*

- 1: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1980.DAT:\*
- 2: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1981.DAT:\*
- 3: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1982.DAT:\*
- 4: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1983.DAT:\*
- 5: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1984.DAT:\*
- 6: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1985.DAT:\*
- 7: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1986.DAT:\*
- 8: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1987.DAT:\*
- 9: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1988.DAT:\*
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- 18: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1998.DAT:\*
- 19: /SID2/gcgdata/geneseq/geneseqn-emb1/NA1999.DAT:\*
- 20: /SID2/gcgdata/geneseq/geneseqn-emb1/NA2000.DAT:\*
- 21: /SID2/gcgdata/geneseq/geneseqn-emb1/NA2001.DAT:\*
- 22: /SID2/gcgdata/geneseq/geneseqn-emb1/NA2001B.DAT:\*
- 23: /SID2/gcgdata/geneseq/geneseqn-emb1/NA2001B.DAT:\*
- 24: /SID2/gcgdata/geneseq/geneseqn-emb1/NA2002.DAT:\*

Pred. No. is the number of results predicted by chance to have a score greater than or equal to the score of the result being printed, and is derived by analysis of the total score distribution.

#### SUMMARIES

Result No.	Score	Query Match	Length	ID	Description
1	1017	100.0	1017	21	AAA62729
2	1017	100.0	1017	21	AAA62729
3	940	92.4	1164	21	AAA62730
4	940	92.4	1164	24	AAA62730
5	417.6	41.1	1017	21	AAA62726
6	417.6	41.1	1017	24	AAA62726
7	404.6	39.8	1083	21	AAA62728
8	404.6	39.8	1083	24	AAA62728
9	393.6	38.7	1041	21	AAA62731

10	393.6	38.7	1041	24	AAA62729
11	367.4	36.1	1101	21	AAA62727
12	367.4	36.1	1101	24	AAA62727
13	288.4	28.4	1043	21	AAA62732
14	288.4	28.4	1043	24	AAA62732
15	221.4	21.8	984	14	AAV16105
16	221.4	21.8	1473	12	AAQ14857
17	221.4	21.8	1473	13	AAQ26407
18	221.4	21.8	1473	13	AAQ26382
19	221.4	21.8	1473	13	AAQ25933
20	221.4	21.8	1473	13	AAQ29935
21	221.4	21.8	1473	14	AAQ49942
22	221.4	21.8	1473	16	AAZ60179
23	221.4	21.8	1473	19	AAV16103
24	219.8	21.6	1473	14	AAQ41733
25	207.4	20.4	1423	17	AAV39049
26	204	20.1	915	19	AAV15075
27	202.8	19.9	922	19	AAV15073
28	200.6	19.7	928	19	AAV15074
29	188	18.5	925	19	AAV15076
30	187.6	18.4	672	24	AAV15076
31	187.6	18.4	672	24	AAV15076
32	186.8	18.4	922	19	AAV15072
33	186	18.3	1154	17	AAV39048
34	184	18.1	1174	17	AAV39050
35	184	18.1	1174	19	AAV39056
36	181	17.8	807	19	AAV16104
37	179.4	17.6	1058	13	AAQ26405
38	179.4	17.6	1060	12	AAQ14856
39	179.4	17.6	1060	13	AAQ26380
40	179.4	17.6	1060	13	AAQ25932
41	179.4	17.6	1060	13	AAQ25934
42	179.4	17.6	1060	13	AAQ30067
43	179.4	17.6	1060	14	AAQ41732
44	179.4	17.6	1060	14	AAQ49941
45	179.4	17.6	1060	16	AAZ60178

#### ALIGNMENTS

RESULT 1  
AAA62729  
ID AAA62729 standard; DNA; 1017 BP.

XX  
AC AAA62729;  
XX  
DT 25-SEP-2000 (first entry)  
XX  
DE Endoglucanase nucleotide sequence 4.  
XX  
KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;  
KW animal foodstuff; ss.  
XX  
OS Mucor circinelloides.  
XX  
PN WO200024879-A1.  
XX  
PD 04-MAY-2000.  
XX  
PF 25-OCT-1999; 99WO-JP05884.  
XX  
PR 23-OCT-1998; 98JP-0302387.  
XX  
PA (MEIJ) MEIJ SEIKA KAISHA LTD.  
XX  
PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;  
XX Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;  
XX WPI; 2000-365117/31.  
XX DR P-PSDB; AAB09824.  
XX  
PT Endoglucanases of fungal origin with high activity under alkaline

Phycomyces nitens  
Endoglucanase nuci  
Rhizopus arrhizus  
Endoglucanase nuci  
Rhizopus arrhizus  
Fusarium oxysporum  
Fusarium oxysporum  
Fusarium oxysporum  
Endoglucanase #2.  
Cellulase containe  
Endoglucanase gene  
Endoglucanase enzy  
F. oxysporum endog  
Fusarium oxysporum  
Dye transfer inhib  
CDNA encoding cell  
Hybrid DNA compri  
Hybrid DNA compri  
Hybrid DNA compri  
Hybrid DNA compri  
Humicola insolens  
Humicola insolens  
CDNA encoding cell  
CDNA encoding cell  
Monocomponent endo  
Humicola insolens  
Humicola insolens  
Humicola insolens  
Humicola insolens  
Cellulase containe  
Endoglucanase gene  
Sequence encoding  
Dye transfer inhib  
Endoglucanase enzy  
H. insolens endog1

PT conditions for production of paper pulp and animal feedstuffs -  
 XX Claim 44; Page 118-119; 180pp; Japanese.

CC This sequence encodes an endoglucanase protein. The invention relates  
 CC to an endoglucanase of fungal origin which can completely break down  
 CC purified cellulose at a concentration of less than 1mg protein/litre,  
 CC and produces more than 50% breakdown of cellulose at pH 8.5. The  
 CC invention includes endoglucanase protein sequences (see  
 CC AA09835-B09830), endoglucanase nucleotide sequences (see  
 CC AA062726-A62732) and primers (AA062733-A62802) which are used in the  
 CC identification of the endoglucanase sequences, and in the construction of  
 CC vectors containing the polynucleotides. The endoglucanase enzymes are  
 CC used for the production of pulp for papermaking and for the production of  
 CC animal foodstuffs.

CC Sequence 1017 BP; 233 A; 255 C; 236 G; 293 T; 0 other;

Query Match 100.0%; Score 1017; DB 21; Length 1017;  
 Best Local Similarity 100.0%; Pred. No. 1.1e-289;  
 Matches 1017; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

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QY 1 ATGAGTTCACCGTGGCTATTCTCAATGCTGTTGACCTGCTCAGCTCTTCTGCT 60
DB 1 ATGAGTTCACCGTGGCTATTCTCAATGCTGTTGACCTGCTCAGCTCTTCTGCT 60
QY 61 GAAGCTGCTTCTTGAAGCTCTGCTCTATGCTCAATGCTGCTGCTGCTGCTGCT 120
DB 61 GAAGCTGCTTCTTGAAGCTCTGCTCTATGCTCAATGCTGCTGCTGCTGCTGCT 120
QY 121 ACCTGTTGAAAGTGGCTCTATGCTGCTGCTCAAGAAAGCAACAATACTACTCTCA 180
DB 121 ACCTGTTGAAAGTGGCTCTATGCTGCTGCTCAAGAAAGCAACAATACTACTCTCA 180
QY 181 TGTCTTCCCGATCCCAAGTAAATGCTGTTAAAGCTGAGACCAAGAAAGATCT 240
DB 181 TGTCTTCCCGATCCCAAGTAAATGCTGTTAAAGCTGAGACCAAGAAAGATCT 240
QY 241 ACCAAGACATCTACTACCAACCGCAAGGCTACTGCTACTGTCACCAAGACATTAAC 300
DB 241 ACCAAGACATCTACTACCAACCGCAAGGCTACTGCTACTGTCACCAAGACATTAAC 300
QY 301 AAGACACTACCAAGACACTACCAAGATGACATGCTGCTGCTGCTTCTACTTCCACC 360
DB 301 AAGACACTACCAAGACACTACCAAGATGACATGCTGCTGCTGCTTCTACTTCCACC 360
QY 361 TCTTCTTCTGCTGTTAAGGTCATCTGCGGGAATCTGGAGAGTGTCCAACT 420
DB 361 TCTTCTTCTGCTGTTAAGGTCATCTGCGGGAATCTGGAGAGTGTGTCCAACT 420
QY 421 CGTTATGGAATGTTGTTAAAGCTTCTGACGCTGGCTGAAAGCTTCTGCTGCT 480
DB 421 CGTTATGGAATGTTGTTAAAGCTTCTGACGCTGGCTGAAAGCTTCTGCTGCT 480
QY 481 CCTGTTGACCTGCTGCTCCATGATCTCTTTATTGATGCCAATGCTCAAGTGT 540
DB 481 CCTGTTGACCTGCTGCTCCATGATCTCTTTATTGATGCCAATGCTCAAGTGT 540
QY 541 TGTAAAGGATGTTAAGGTTCAATGTTAACAACAACCACTTGGGCTGTCATATGAG 600
DB 541 TGTAAAGGATGTTAAGGTTCAATGTTAACAACAACCACTTGGGCTGTCATATGAG 600
QY 601 CTCGCTTACGCTTGGCTGCTCTATGCTGCTGCTCAAGCAAGCTGATGTTGT 660
DB 601 CTCGCTTACGCTTGGCTGCTCTATGCTGCTGCTCAAGCAAGCTGATGTTGT 660
QY 661 GCGCTTATGATTAATGACCTTCACTTCTGCGCTGCTTCTGAAAGAAAGTGTCTCA 720
DB 661 GCGCTTATGATTAATGACCTTCACTTCTGCGCTGCTTCTGAAAGAAAGTGTCTCA 720
QY 721 GTTACCAACACCGGATGAGATTAGGCTTAAACCTTGAATTTGCAATGCGCGTGT 780
DB 721 GTTACCAACACCGGATGAGATTAGGCTTAAACCTTGAATTTGCAATGCGCGTGT 780

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QY 781 GCGCTTATGATTAATGACCTGCTGCTGCTCAATGAGGCGCTCCCAATGATGCTGGGA 840
DB 781 GCGCTTATGATTAATGACCTGCTGCTGCTCAATGAGGCGCTCCCAATGATGCTGGGA 840
QY 841 GCTAATATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 900
DB 841 GCTAATATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 900
QY 901 GCTGTTGTTAATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 960
DB 901 GCTGTTGTTAATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 960
QY 961 AAGGAAGTACCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1017
DB 961 AAGGAAGTACCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1017

```

RESULT 2  
 AAL43247  
 ID AAL43247 standard; DNA; 1017 BP.

AC AAL43247;  
 DT 22-AUG-2002 (first entry)  
 DE Rhizopus arrhizus endoglucanase-related coding sequence 4.  
 XX Zygomycetes-originated endoglucanase; cellulose binding domain;  
 XX fibre processing; waste paper de-linking; paper pulp; ds, gene.  
 OS Mucor circinelloides.  
 PN M0200242474-A1.  
 PD 30-MAY-2002.

PF 21-NOV-2001; 2001WO-JP10188.  
 PR 21-NOV-2000; 2000JP-0354296.

PA (MEIJ ) MEIJI SEIKA KAISHA LTD.

PI Nakane A, Baba Y, Koga J, Kubota H;

DR WPI; 2002-471729/50.

PS P-PSDB; AAO15055.

PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,  
 PT with effect of endoglucanase activity enhanced in processing fibers,  
 PT delinking waste paper and improving freeness of paper pulp -  
 PS Disclosure: Page 70-73; 109pp; Japanese.

CC The invention comprises the amino acid and coding sequences of  
 CC zygomycetes-originated endoglucanase enzymes lacking the cellulose  
 CC binding domain. The zygomycetes-originated endoglucanase enzymes of the  
 CC invention have enhanced endoglucanase activity. The zygomycetes-  
 CC originated endoglucanase enzymes of the invention are useful for  
 CC processing fibres, de-linking waste paper and improving the freeness of  
 CC paper pulp - which is particularly applicable in detergent compositions.  
 CC The present DNA sequence represents an endoglucanase-related gene  
 CC sequence of the invention.

CC Sequence 1017 BP; 233 A; 255 C; 236 G; 293 T; 0 other;

Query Match 100.0%; Score 1017; DB 24; Length 1017;  
 Best Local Similarity 100.0%; Pred. No. 1.1e-289;  
 Matches 1017; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

```

QY 1 ATGAGTTCACCGTGGCTATTCTCAATGCTGTTGACCTGCTCAGCTCTTCTGCT 60
DB 1 ATGAGTTCACCGTGGCTATTCTCAATGCTGTTGACCTGCTCAGCTCTTCTGCT 60

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QY	6	GAAGCTGCTCTTGGACGCTCTGCTCATATGGTCAATGGTGGCAATTGGATGAGTGAAGT	120
Db	61	GAAGCTGCTCTTGGACGCTCTGCTCATATGGTCAATGGTGGCAATTGGATGAGTGAAGT	120
QY	121	ACCTGTTGTGAAGTGGCTCTACTTGGCTGCTCAAGAGGCAACAAATCTACTCTCA	180
Db	121	ACCTGTTGTGAAGTGGCTCTACTTGGCTGCTCAAGAGGCAACAAATCTACTCTCA	180
QY	181	TGTCCTTCCGGATATCCACAGTAACAATGTGGTAAAGCTAGACGACCAAGAAACATCT	240
Db	181	TGTCCTTCCGGATATCCACAGTAACAATGTGGTAAAGCTAGACGACCAAGAAACATCT	240
QY	241	ACCAAGACATCTACTACGACCGCGAAGGCTACTGCTACTGTCACCAACAAAGAGTAAC	300
Db	241	ACCAAGACATCTACTACGACCGCGAAGGCTACTGCTACTGTCACCAACAAAGAGTAAC	300
QY	301	AAGACAATCTACCAAGACAACTACCAAGACTAGCTAGCGCTGCTTCTACTTCCACC	360
Db	301	AAGACAATCTACCAAGACAACTACCAAGACTAGCTAGCGCTGCTTCTACTTCCACC	360
QY	361	TCTTCTTCTGCTGCTGCTTCAAGGTCACTCTGCGCGGTAATCTGGAGATGTTCCAACT	420
Db	361	TCTTCTTCTGCTGCTGCTTCAAGGTCACTCTGCGCGGTAATCTGGAGATGTTCCAACT	420
QY	421	CGTTATTTGGATTTGTTGTAAGCTTTCGACCTGGCCGGAAGAAAGCTTCTGTCACCTG	480
Db	421	CGTTATTTGGATTTGTTGTAAGCTTTCGACCTGGCCGGAAGAAAGCTTCTGTCACCTG	480
QY	481	CGTGTGACACCTGCTGCTCCATAGGTATCTGTTATTAGATGCAATGCTCAAGTGGT	540
Db	481	CGTGTGACACCTGCTGCTCCATAGGTATCTGTTATTAGATGCAATGCTCAAGTGGT	540
QY	541	TGTAAAGGTGATGATGTTTCAATGTAAACAACAACAACTTGGGCTGTCAATGATGAG	600
Db	541	TGTAAAGGTGATGATGTTTCAATGTAAACAACAACAACTTGGGCTGTCAATGATGAG	600
QY	601	CTGGCTTAAGGTTTGGCTGCTGCTTAAATGGCGCTCAACGAAGCTGAAATGGTGTG	660
Db	601	CTGGCTTAAGGTTTGGCTGCTGCTTAAATGGCGCTCAACGAAGCTGAAATGGTGTG	660
QY	661	GAGCTGTATGAAATGACCTTCACTTTCGCGCTGCTTCTGGAATAGAAATGTTTCAA	720
Db	661	GAGCTGTATGAAATGACCTTCACTTTCGCGCTGCTTCTGGAATAGAAATGTTTCAA	720
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Db	721	GTTAACCAACACCGGTGGCGATTGAGCTTAAACACTTGAATTCGAAATGCCCCGGTGT	780
QY	781	GGGGTTGGTATCTTCAATGGCTGTGCTGCTCAATGGGGGGGCTCCAAAGATGGCTGGGG	840
Db	781	GGGGTTGGTATCTTCAATGGCTGTGCTGCTCAATGGGGGGGCTCCAAAGATGGCTGGGG	840
QY	841	GCTAGATATGGTGGTCAAGCTTCTGCTCTGACTGTGCTCTTCCCTGCTCTTCAA	900
Db	841	GCTAGATATGGTGGTCAAGCTTCTGCTCTGACTGTGCTCTTCCCTGCTCTTCAA	900
QY	901	GCTGGTTGTAATGAGATTCAACTGGTTCAGAACTGTATACCTTAACATGACCTTC	960
Db	901	GCTGGTTGTAATGAGATTCAACTGGTTCAGAACTGTATACCTTAACATGACCTTC	960
QY	961	AAGGAAGTTACCTGCTGCTGCTGAATTAACCTACCTGCTCAAGTTTGGAAAGAAAGTAA	1017
Db	961	AAGGAAGTTACCTGCTGCTGCTGAATTAACCTACCTGCTCAAGTTTGGAAAGAAAGTAA	1017

RESULT 3	
AAA62730	
ID	AAA62730 standard; DNA; 1164 BP
XX	
AC	AAA62730;
XX	
DT	25-SEP-2000 (first entry)

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DE   Endoglucanase nucleotide sequence 5.
XX
XX   Endoglucanase; cellulose breakdown; produce pulp; papermaking;
KM   animal foodstuff; ss.
XX
XX   Mucor circinelloides.
OS
XX   WO200024879-A1.
PN
XX
XX   04-MAY-2000.
PD
XX
XX   25-OCT-1999;    99WO-JP05884.
PE
XX
XX   23-OCT-1998;    98JP-0302387.
PR
XX
XX   (MEIJU ) MEIJI SEIKA KAISHA LTD.
PA
PI   Nakamura Y., Moriya T., Baba Y., Yanai K., Sumida N., Niehimura T.;
PI   Murashima K., Nakane A., Yasuchi T., Koga J., Murakami T., Kono T.;
XX
XX   WPI; 2000-365117/31.
DR
XX
XX   P-PESDB; AA09825.
PT
XX       Endoglucanases of fungal origin with high activity under alkaline
CC       conditions for production of paper pulp and animal feedstuffs -
Claim 44; Page 122-124; 180pp; Japanese.
PS
XX
XX       This sequence encodes an endoglucanase protein. The invention relates
CC       to an endoglucanase of fungal origin which can completely break down
CC       purified cellulose at a concentration of less than 1mg protein/litre,
CC       and produces more than 50% breakdown of cellulose at pH 8.5. The
CC       invention includes endoglucanase protein sequences (see
CC       AB09825-809830), endoglucanase nucleotide sequences (see
CC       AAA62726-462732) and primers (AAA62733-462802) which are used in the
CC       identification of the endoglucanase sequences, and in the construction of
CC       vectors containing the polynucleotides. The endoglucanase enzymes are
CC       used for the production of pulp for papermaking and for the production of
CC       animal foodstuffs.
SQ
Sequence 1164 BP; 272 A; 289 C; 266 G; 337 T; 0 other;

Query Match      92.4%; Score 940; DB 21; Length 1164;
Best Local Similarity 98.4%; Pred. No. 6,4e+267;
Matches 949; Conservative 0; Mismatches 15; Indels 0; Gaps 0;

QY     54 TTTCGCTGAACACTGGTTTGTGCAGCTCGTCAATGTAAGTGCGTAGTGGATTGATGAG 113
DB     |||||
OY     114 TGACAATACTAGTTGTGAAAGAATGCGTCACTTGGCTTGCTCAAGAACCAATACTA 173
DB     |||||||
OY     261 TGACACTACCTGTGTGAAAGTGGCTCCTACTTGGCTTCTCAAGAACCAATACTA 320
DB     |||||||
OY     174 CTTCATATGTCTTCCCAGATCCAACAGTAACATGCTGTAAACGCTACAGCACCAA 233
DB     |||||
OY     321 CTCCTCATATGTCTTCCCAGATCCAACAGTAACATGCTGTAAACGCTACAGCAA 380
DB     |||||
OY     234 GACATCTTCAAGACATCTACTACCAACGCCCAAGCTACTGTACTGTGCACCACAAGNC 293
DB     |||||
OY     381 GACATCTTCAAGACATCTACTACCAACGCCCAAGCTACTGTACTGTGCACCACAAGNC 440
DB     |||||
OY     284 AGTAACCAAGCAACTACCAAGACAACTACCAAGCAAGTACGACTACTGCGGCTTTCTAC 353
DB     |||||
OY     441 AGTAACCAAGCAACTACCAAGACAACTACCAAGCAAGTACGACTACTGCGGCTTTCTAC 500
DB     |||||
OY     354 TTCACACTCTTCTTCTGCTGTGTAACAAGTATCTTGGCGGTAAATCTGGCAGTGTTC 413
DB     |||||
OY     501 TTCCACCTCTTCTTCTGCTGTGTAACAAGTATCTTGGCGGTAAATCTGGCAGTGTTC 560
DB     |||||
OY     414 CAACAATGTTATTTGGATTGTTGTAAGCTTTCTTGACGTGGCTTGAAAAAGCTTTCTGT 473

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Db 561 CACAACTCTGTAATGGAGATTGTTGTAAGCTTCTGACCTGAGCTGAGAAAGCTTCGT 620  
 QY 474 CACTGCTCTGTTGACACCTGCTGCCTCAAGGATCTCTTATATAGAGCAATGCTCA 533  
 Db 621 CACTGCTCTGTTGACACCTGCTGCCTCAAGGATCTCTTATATAGAGCAATGCTCA 680  
 QY 534 AAGTGGTGTAAACGGTGTATGTTTCATGCTGTAACAACAACCACTTGGGCTGTCA 533  
 Db 681 AAGTGGTGTAAACGGTGTATGTTTCATGCTGTAACAACAACCACTTGGGCTGTCA 740  
 QY 594 TGAATAGCTCGCTTACGGTGTTCGCTGCTGCTCTTATGCTGCTCAAGAGTGTATG 653  
 Db 741 TGAATAGCTCGCTTACGGTGTTCGCTGCTGCTCTTATGCTGCTCAAGAGTGTATG 800  
 QY 654 GTGTTGTGCTGTATGAAATGACCTTCACTTGTGAGCGCTGCTGTGGAAGAAGATG 713  
 Db 801 GTGTTGTGCTGTATGAAATGACCTTCACTTGTGAGCGCTGCTGTGGAAGAAGATG 860  
 QY 714 TGTTCAGTTACCAACACCGGTGGCATTTAGGCTTAAACCTTGAATTTGCAATGCC 773  
 Db 861 TGTTCAGTTACCAACACCGGTGGCATTTAGGCTTAAACCTTGAATTTGCAATGCC 920  
 QY 774 CGGTGGTGGCTGTGTAATCTTCAATGAGCTGCTGCTCAATGAGCGCTCCCAATGATG 833  
 Db 921 CGGTGGTGGCTGTGTAATCTTCAATGAGCTGCTGCTCAATGAGCGCTCCCAATGATG 980  
 QY 834 CTGGGAGAGTATGATGTTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 893  
 Db 981 CTGGGAGAGTATGATGTTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 1040  
 QY 894 TCTTCAGCTGCTGTGTAATGAGATTCATCTGCTGCTGCTGCTGCTGCTGCTGCTG 953  
 Db 1041 TCTTCAGCTGCTGTGTAATGAGATTCATCTGCTGCTGCTGCTGCTGCTGCTGCTG 1100  
 QY 954 GACCTTCAAGAGATGATCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1013  
 Db 1101 GACCTTCAAGAGATGATCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1160  
 QY 1014 GTTA 1017  
 Db 1161 GTTA 1164

RESULT 4  
 AAL43248  
 ID AAL43248 standard; DNA; 1164 BP.  
 XX AAL43248;  
 AC XX  
 XX XX  
 DT 22-AUG-2002 (first entry)  
 XX XX  
 DE Rhizopus arrhizus endoglucanase-related coding sequence 5.  
 XX XX  
 KM Zygomycetes-originated endoglucanase; cellulose binding domain;  
 XX fibre processing; waste paper de-inking; paper pulp; ds; gene.  
 XX Mucor circinelloides.  
 OS  
 XX WO200242474-A1.  
 PN  
 XX 30-MAY-2002.  
 PD  
 XX 21-NOV-2001; 2001WO-JP10188.  
 PP  
 XX 21-NOV-2000; 2000JP-0354296.  
 PR  
 XX (MEIJU) MEIJU SEIKA KAISHA LTD.  
 PA  
 XX Nakane A, Baba Y, Koga J, Kubota H;  
 XX PI  
 XX WPI; 2002-471729/50.  
 DR P-PSDB; A015056.  
 XX

PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,  
 PT with effect of endoglucanase activity enhanced in processing fibers,  
 PT deinking waste paper and improving freeness of paper pulp -  
 PS Disclosure; Page 75-78; 109pp; Japanese.

CC The invention comprises the amino acid and coding sequences of  
 CC Zygomycetes-originated endoglucanase enzymes lacking the cellulose  
 CC binding domain. The zygomycetes-originated endoglucanase enzymes of the  
 CC invention have enhanced endoglucanase activity. The zygomycetes-  
 CC originated endoglucanase enzymes of the invention are useful for  
 CC processing fibers, de-inking waste paper and improving the freeness of  
 CC paper pulp - which is particularly applicable in detergent compositions.  
 CC The present DNA sequence represents an endoglucanase-related gene  
 CC sequence of the invention.

Sequence 1164 BP; 272 A; 289 C; 266 G; 337 T; 0 other;

Query Match 92.4%; Score 940; DB 24; Length 1164;  
 Best Local Similarity 98.4%; Pred. No. 6,4e-267;  
 Matches 949; Conservative 0; Mismatches 15; Indels 0; Gaps 0;

QY 54 TCTGCTGAGAGCTGCTTCTTCACTGCTGTCTATGCTCAATGCTGAGATGATGAG 113  
 Db 201 TTCTCTCATCATCATCATATGATGATGATGATGATGATGATGATGATGATGAG 260  
 QY 114 TGGACCTACCTGTTGTGTAATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 173  
 Db 261 TGGACCTACCTGTTGTGTAATGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTG 320  
 QY 174 CTCTCAATGCTTCTCCGAGTCCACAGTAACATGCTGTGTAACGCTGACACCAAGAA 233  
 Db 321 CTCTCAATGCTTCTCCGAGTCCACAGTAACATGCTGTGTAACGCTGACACCAAGAA 380  
 QY 234 GACATATACCAAGAT 293  
 Db 381 GACATATACCAAGAT 440  
 QY 294 AGTAACCAAGACACTATACCAAGACACTATACCAAGACACTATACCTGCTGCTTAC 353  
 Db 441 AGTAACCAAGACACTATACCAAGACACTATACCAAGACACTATACCTGCTGCTTAC 500  
 QY 354 TTCCACTCTTCTTCTGCTGCTTACAGATCATCTGCGGCTGTAATCTGCACTGCTTC 413  
 Db 501 TTCCACTCTTCTTCTGCTGCTTACAGATCATCTGCGGCTGTAATCTGCACTGCTTC 560  
 QY 414 CACAACCTGTTATGGAGTTGTTGTAAGCTTCTGCACTGCTGCTGCAAGAAAGCTTCTGT 473  
 Db 561 CACAACCTGTTATGGAGTTGTTGTAAGCTTCTGCACTGCTGCTGCAAGAAAGCTTCTGT 620  
 QY 474 CACTGCTCTGTTGACACCTGCTGCTCAATGATCTCTTATATAGTCAATGCTCA 533  
 Db 621 CACTGCTCTGTTGACACCTGCTGCTCAATGATCTCTTATATAGTCAATGCTCA 680  
 QY 534 AAGTGGTGTAAACGGTGTATGTTTCATGCTGTAACAACAACCACTTGGGCTGTCA 593  
 Db 681 AAGTGGTGTAAACGGTGTATGTTTCATGCTGTAACAACAACCACTTGGGCTGTCA 740  
 QY 594 TGAATAGCTCGCTTACGGTGTTCGCTGCTGCTCTTATGCTGCTCAAGAGTGTATG 653  
 Db 741 TGAATAGCTCGCTTACGGTGTTCGCTGCTGCTCTTATGCTGCTCAAGAGTGTATG 800  
 QY 654 GTGTTGTGCTGTATGAAATGACCTTCACTTGTGAGCGCTGCTGTGGAAGAAGATG 713  
 Db 801 GTGTTGTGCTGTATGAAATGACCTTCACTTGTGAGCGCTGCTGTGGAAGAAGATG 860  
 QY 714 TGTTCAGTTACCAACACCGGTGGCATTTAGGCTTAAACCTTGAATTTGCAATGCC 773  
 Db 861 TGTTCAGTTACCAACACCGGTGGCATTTAGGCTTAAACCTTGAATTTGCAATGCC 920  
 QY 774 CGGTGGTGGCTGTGTAATCTTCAATGAGCTGCTGCTCAATGAGCGCTCCCAATGATG 833  
 Db 921 CGGTGGTGGCTGTGTAATCTTCAATGAGCTGCTGCTCAATGAGCGCTCCCAATGATG 980



Db	412	TATTGGAAATGCTGTAAAGCCCTCTGTAGCTGAGCCCGGTAAGCCCAATGTCATCTTCT	471
Qy	484	GTTGACACCGTGGCTCCCAATAGTATCTCT---TTATTAGATGCCATGCTCAAGTGGT	540
Db	472	GTCAGTCTCTGTAAACAAGATGTTGTCACCTGCTTAGTGCAGAGTAAGCCCAAGTGGC	531
Qy	541	TGTAAAGGTGTAAATGTTTCATGTCTTAAACAACAACCAACTTGGGCTGTCAATGATGAG	600
Db	532	TGTAAAGGTGTAAACAGTTACATGTGTAAACAACAACCAACTTGGGCTGTAAACGACAAAC	591
Qy	601	CTGCCTTAAGGTTTCGCTGCTGCTCTCTATTTGCTGTGCTTCAACGAACTGATGTTGT	660
Db	592	CTTGCTATGTTTTCGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	651
Qy	661	GAGCTGTATGATTAATGACCTTCACTTCTGAGGCTGCTTCTGGAAGAAAGATGTTGTCAA	720
Db	652	TCTTGTTTTCGAATCTTACTTTCACCTTCTTACTCTGTGTGTGTGTAAAGATGTTGCCAA	711
Qy	721	GTTAACCAACCCGGTGGGAGATTAGGCTC-----TAACCACTTGATTGGCAAAAG	771
Db	712	GTCACCTAACACTGTGTGTGATCTTGGCTTCCCTCTACTGCTGCTCACTTGTGACCTTGC	771
Qy	772	CCCGGTGGTGGCGTTGGTATCTTCAATGCTGTGCTGCTCAATGGGGCGCTCCCAATGAT	831
Db	772	CCCGGTGGTGGCGTTGGTATCTTCAATGCTGTGCTGCTCAATGGGGCGCTCCCAATGAT	831
Qy	832	GCGTGGGAGAGCTAGATATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT	891
Db	832	GCGTGGGAGAGCTAGATATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT	891
Qy	892	GCTCTTCAAGCTGTTGTAAATGAGATTTCAACTGCTTCAAGAACTGATTAACCTTACC	951
Db	892	GCACTCCAGCTGTTGTAAATGAGATTTCAACTGCTTCAAGAACTGATTAACCTTACC	951
Qy	952	ATGACCTTCAAGAAATTAAGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1011
Db	952	ATGACCTTCAAGAAATTAAGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT	1011
Qy	1012	AAGTAA 1017	
Db	1012	AAATTA 1017	

RESULT 7  
 AAA62728  
 ID AAA62728 standard; DNA; 1083 BP.  
 XX AAA62728;  
 AC XX  
 AC XX  
 DT 25-SEP-2000 (first entry)  
 DT XX  
 DE Endoglucanase nucleotide sequence 3.  
 DE XX  
 KW Endoglucanase; cellulose breakdown; produce pulp; papermaking;  
 KW animal foodstuff; ss.  
 OS Rhizopus oryzae.  
 OS XX  
 XX MO200024879-A1.  
 XX PN  
 XX PD 04-MAY-2000.  
 XX PF 25-OCT-1999; 99WO-JP05884.  
 XX ER 23-OCT-1998; 98JP-0302387.  
 XX PA (MEIJ) MEIJI SEIKA KAISHA LTD.  
 XX PI Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T;  
 XX PI Muraishi K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;  
 XX WP1: 2000-365117/31.  
 DR P-PsDB; AAB09823.



XX Endoglucanases of fungal origin with high activity under alkaline  
 PT conditions for production of paper pulp and animal feedstuffs  
 XX  
 PS Claim 44, Page 113-115, 180pp; Japanese.  
 XX  
 CC This sequence encodes an endoglucanase protein. The invention relates  
 CC to an endoglucanase of fungal origin which can completely break down  
 CC purified cellulose at a concentration of less than 1mg protein/litre,  
 CC and produces more than 50% breakdown of cellulose at pH 8.5. The  
 CC invention includes endoglucanase protein sequences (see  
 CC AAB09825-809830), endoglucanase nucleotide sequences (see  
 CC AAB62726-A62732) and primers (AAB62732-A62802) which are used in the  
 CC identification of the endoglucanase sequences, and in the construction of  
 CC vectors containing the polynucleotides. The endoglucanase enzymes are  
 CC used for the production of pulp for papermaking and for the production of  
 CC animal foodstuffs.  
 XX  
 SQ Sequence 1083 BP; 260 A; 297 C; 231 G; 295 T; 0 other;  
 Query Match 39.8%; Score 404.6; DB 21; Length 1083;  
 Best Local Similarity 65.6%; Pred. No. 7.1e-109;  
 Matches 671; Conservative 0; Mismatches 289; Indels 63; Gaps 3;  
 QY 58 GCTGAAGCTGCTTCTGAGCTCTGTCTATGTCATATGTCGATGAGTGA 117  
 DB 61 GCCCATGCTGCTGATGATGACAGGCTTACCAATGTGATGTAAGAACTGGAGTGA 120  
 QY 118 CTTACTGTTGTGAAGTGGCTTACTTGGTGTCTCAAGAGCACAATTAATCTACTCT 177  
 DB 121 CTTACTGCTGTGATCTGGCTTACTTGGCTGATTAATCTCAAACTCTTCTACTCC 180  
 QY 178 CAATGCTTCC-----CGATCCCAAGTAAATGCTGTAATGCTAGCAGACACC 228  
 DB 181 CAATGCTTCCCAATGAATTAATCTCACTCCCAATTAATCTTCAAAAAACCACT 240  
 QY 229 AAGAAGCATCTACCAAGACATCTACT----- 255  
 DB 241 ACTGAGAGTGCAGAAAGACATCACTAAGTTCAGAGAACCACTACTGAA 300  
 QY 256 -----ACCAACGCGAAGGCTAATCTGCTACACCAACCAAGATTAACCAAG 303  
 DB 301 GCTCTAAGAGACACCACTACTGAGACTTCAAGAGACCACTACTGAGAGCTCT 360  
 QY 304 ACAACTACCAAGACCACTACCAAGACTAGCACTACTGCGGTGCTTCACTTCCACTCT 363  
 DB 361 AAGAAGACACCACTACTACCAAGAGGCTTCTACCTCACTTCTCTCTCTCTCT 420  
 QY 364 TCTTCTGCTGTTACCAAGTATCTCTGCGGTAAATGTGCAATGTTCCAACTGCT 423  
 DB 421 GCTTCTAACAATCTACTCGGCTGTCTGTGTGTGCTCTCGGTAAATGTGAAACCACTGCG 480  
 QY 424 TATTGGAGTTGTGAAGCTTCTTGACGCTGCGCTGAAAAAGCTTCTGCACTGCTCT 483  
 DB 481 TACTGGAGTTGTGAAGCTTCTTGACGCTGCGGTAAAGCTGATGATCACTCCCT 540  
 QY 484 GTTGACACCTGCTCCAAATGTATCTTTAATAGTGCATAGTCAAGAGTGTGT 543  
 DB 541 GTTGAGCTCTTAACAAGATGTGAAGCTCTGTGTAACAACACTCAAAACGCGCTGT 600  
 QY 544 AACGGTGAATGTTGATGTATGTAACAACAACCACTTGGGCTGTCAATGATGAGCTC 603  
 DB 601 GTTGCTGTGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 660  
 QY 604 GCTTACGTTTCTGCTGCTCTTATATGCTGCTCAACGAAGCTGATGATGATGATGATGATGAT 663  
 DB 661 GCTTACGTTTCTGCTGCTCTTATATGCTGCTCAACGAAGCTGATGATGATGATGATGATGAT 720  
 QY 664 TGTATGAATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 723  
 DB 721 TGTATGAATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 780  
 QY 724 ACCAACCAGGCTGAGATTAAGCTCTAACC-----CACTTGTATGATGCAATGATGCC 774

DB 781 ACCAACCAGGCTGAGATTAAGCTCTAACC-----CACTTGTATGATGCAATGATGCC 840  
 QY 775 GGTGATGAGCTGTTATCTTCAATGCTGCTGCTCAATGAGGAGCGCTCCCAATGATGAGC 834  
 DB 841 GGTGATGAGCTGTTATCTTCAATGCTGCTGCTCAATGAGGAGCGCTCCCAATGATGAGT 900  
 QY 835 TGGGAGACTGATATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 894  
 DB 901 TGGGAGACTGATATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 960  
 QY 895 CTTCAAGCTGTTGTAATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 954  
 DB 961 CTTCAAGCTGTTGTAATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 1020  
 QY 955 ACCTTCAAGAGATTAATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 1014  
 DB 1021 ACCTTCAAGAGATTAATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGATGAT 1080  
 QY 1015 TAA 1017  
 DB 1081 TAA 1083  
 RESULT 8  
 AAL43246  
 ID AAL43246 standard; DNA; 1083 BP.  
 XX  
 AC AAL43246;  
 XX  
 DT 22-AUG-2002 (first entry)  
 XX  
 DE Rhizopus arrhizus endoglucanase-related coding sequence 3.  
 XX  
 KM Zygomycetes-orientated endoglucanase; cellulose binding domain;  
 KM fibre processing; waste paper de-inking; paper pulp; ds; gene.  
 XX  
 OS Rhizopus arrhizus.  
 XX  
 PN WO200242474-A1.  
 XX  
 PD 30-MAY-2002.  
 XX  
 PP 21-NOV-2001; 2001WO-JP10188.  
 XX  
 PR 21-NOV-2000; 2000JP-0354296.  
 XX  
 PA (MEIJ) MEIJ SEIKA KAISHA LTD.  
 XX  
 PI Nakane A, Baba Y, Koga J, Kubota H;  
 XX  
 DR WPI; 2002-471729/50.  
 DR P-PSDB; AAO15054.  
 XX  
 PT Cellulose-binding domain-lacking Zygomycetes-orientated endoglucanase,  
 PT with effect of endoglucanase activity enhanced in processing fibers,  
 PT deinking waste paper and improving freeness of paper pulp -  
 XX  
 PS Disclosure; Page 65-68; 109pp; Japanese.  
 XX  
 CC The invention comprises the amino acid and coding sequences of  
 CC zygomycetes-orientated endoglucanase enzymes lacking the cellulose  
 CC binding domain. The zygomycetes-orientated endoglucanase enzymes of the  
 CC invention have enhanced endoglucanase activity. The zygomycetes-  
 CC orientated endoglucanase enzymes of the invention are useful for  
 CC processing fibers, de-inking waste paper and improving the freeness of  
 CC paper pulp - which is particularly applicable in detergent compositions.  
 CC The present DNA sequence represents an endoglucanase-related gene  
 CC sequence of the invention.  
 XX  
 SQ Sequence 1083 BP; 260 A; 297 C; 231 G; 295 T; 0 other;  
 Query Match 39.8%; Score 404.6; DB 24; Length 1083;



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QY 262 GCCAAGGCTACTGTAAGTGTGACCAACCAAGACAGTAACCAAGACCACTAACAAGCAACT 321
DB 286 ACCAACAAGGCCCTGTACACACCAACAGGCACTACTACTACCAACCAACCAACCAACC 345
QY 322 ACCAAGACTAGCACTACTGCGGCTGCTTCACTTCACTTCTTCTGCTGTTTACAG 381
DB 346 ACCAAGACCAACCAACCAAGGCTGCCACCAACCTCTCTTCAACACTGGCTACAGC 405
QY 382 GTCACTCTGCGGCTAAATCTGCAAGGTGTCCCAACTGCTTATGGAGATTGTGTAAA 441
DB 406 CCCATTTCTGTGTCTTCTGTGAAACGGTGCACCTACCGCTACTGGATTGTGCAAG 465
QY 442 GCTTCTTGACAGCTGAGCTGCAAAAGCTTCTGTCACTGCTGCTGTGACACTGTGCTCC 501
DB 466 CCTCTTGGCGCTGGAGAGGAAAGCTTCTTAACCTGTAACCTGTAACCTGTGCAAG 525
QY 502 AATGTAATCTCTTTATTAAGATGCAATGCTCAAAAGTGTGTAACGCTGTAATGTTTC 561
DB 526 GATGCTGTCAAGCCCTCTCGGTTCCGATGTCCAGAGCGGTTGGTCGCGCCAGGCTAC 585
QY 562 ATGTGTAACAACAACAACCTTGGGCTGCTCAATGATGCTGCTTACGCTTGGCTGCT 621
DB 586 ATGTGCAATGACAACAAGCCCTGAGGTGTCAATGACGACTTGTGCTAGCGTTGGCTGCT 645
QY 622 GCTCTATTTGCTGCTCCAAAGAGCTGATGATGTTGTGCTGTTATGAATGACCTTC 681
DB 646 GCCAGTCTCGGTAGCGCGGCTGCTGATTTCTGCTGCGCTGTTAGAGACTTACCTTC 705
QY 682 ACTTCTGCGCTGCTTCTGAAAGAGATGTTGTTCAAGTTACCAACCGGTCGAT 741
DB 706 ACCAACAAGCTGCTGCTGCGCAAGAAAGTTTGTCTGCAAGTACCAACACCGGATGAT 765
QY 742 TTAGGCTCTAACCACTTGTGATTTGCAATGCTGCTGCTGCTGCTGCTGCTGCTGCT 801
DB 766 CTCAGCAACAACAACCTTGTGATTTGCAATGCTGCTGCTGCTGCTGCTGCTGCTGCT 825
QY 802 TGTGCTGCTCAATGAGGCGCTCCCAATGATGCTGAGGAGCTGAATGATGATGCTGCTGCT 861
DB 826 TGCAGTCTCAAGTGAACCAACCAAGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 885
QY 862 TCTGCTCTGACTGCTGCTCTTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCT 921
DB 886 TCTATTTCAAGTGTGCAAGCTTCTCAACGATTTGCAAGGCTGCTGCTGCTGCTGCTGCTGCT 945
QY 922 AACTGCTCAAGCACTGATTAACCTTCACTGACTTCAAGAGTTAAGTCTGCTGCT 981
DB 946 GAATGCTCAAGCAAGCTGCAACCAAGGCTCAAGGCTGCTGCTGCTGCTGCTGCTGCTGCT 1005
QY 982 GAATTAACCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1017
DB 1006 GAGATCAATTGCAAGACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1041

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RESULT 10
AAL43249
ID AAL43249 standard; DNA; 1041 BP.
AC AAL43249;
DT 22-AUG-2002 (first entry)
DE Phycomyces nitens endoglucanase-related coding sequence.
XX Zygomyces-originated endoglucanase; cellulose binding domain;
XX fibre processing; waste paper de-inking; paper pulp; ds; gene.
XX Phycomyces nitens.
XX WO200242474-A1.
XX 30-MAY-2002.
XX 21-NOV-2001; 2001WO-JP10188.
PF

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XX 21-NOV-2000; 2000JP-0354296.
PR (MEIJU) SEIKA KAISHA LTD.
PA Nakane A, Baba Y, Koga J, Kubota H;
XX WPI: 2002-471729/50.
DR P-PSDB: AAO15057.
XX Cellulose-binding domain-lacking Zygomyces-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp
XX Disclosure; Page 81-83; 109pp; Japanese.
XX The invention comprises the amino acid and coding sequences of
CC Zygomyces-originated endoglucanase enzymes lacking the cellulose
CC binding domain. The Zygomyces-originated endoglucanase enzymes of the
CC invention have enhanced endoglucanase activity. The Zygomyces-
CC originated endoglucanase enzymes of the invention are useful for
CC processing fibres, de-inking waste paper and improving the freeness of
CC paper pulp - which is particularly applicable in detergent compositions.
CC The present DNA sequence represents an endoglucanase-related gene
CC sequence of the invention.
SQ Sequence 1041 BP; 225 A; 352 C; 248 G; 216 T; 0 other;
Query Match 38.7%; Score 393.6; DB 24; Length 1041;
Best Local Similarity 63.7%; Pred. No. 1.2e-105;
Matches 634; Conservative 0; Mismatches 329; Indels 33; Gaps 1;
QY 55 TCTGCTAAGCTGCTTCTTCTGAGCTCTGTATGTAAGTGTGCGATTGATGAGT 114
DB 46 TCCACTTAACGCTGTGAATGACCAAGCTATGCGCAAGTGTGTGGAAGATGAGT 105
QY 115 GCACTCACTGTTGTGAAGGCTCTACTTGTCTGCTCAAGAAGCAACAATACTAC 174
DB 106 GGTCCACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 165
QY 175 TCTCAATGCTTCTCCGATGCCA-----CAGT 201
DB 166 TCTCAAGTATCCCAACGATCAAGTCAAGGTAACCCCAAGACCAACCAACCAACCAAC 225
QY 202 AACATGCTGTAACTGTAAGCAACAAGCAACAAGCAACAAGCAACAAGCAACAAGCAACA 261
DB 226 ACCAAGCTGCACTTACCAAGGCTCTGTCAACAACAAGCAACAAGCAACAAGCAACAAG 285
QY 262 GCCAAGGCTACTGCTACTGTGACCAACAAGCAAGTAAACAAGCAACAAGCAACAAGCAACA 321
DB 286 ACCAACAAGGCCCTGTACACACCAACAGGCTGCCACCACTCTCTTCAACACTGGCTACAGC 345
QY 322 ACCAAGACTAGCACTACTGCGGCTGCTTCACTTCACTTCTTCTGCTGTTTACAG 381
DB 346 ACCAAGACCAACCAACCAAGGCTGCCACCAACCTCTCTTCAACACTGGCTACAGC 405
QY 382 GTCACTCTGCGGCTAAATCTGCAAGGTGTCCCAACTGCTTATGGAGATTGTGTAAA 441
DB 406 CCCATTTCTGTGTCTTCTGTGAAACGGTGCACCTACCGCTACTGGATTGTGCAAG 465
QY 442 GCTTCTTGACAGCTGAGCTGCAAAAGCTTCTGTCACTGCTGCTGTGACACTGTGCTCC 501
DB 466 CCTCTTGGCGCTGGAGAGGAAAGCTTCTTAACCTGTAACCTGTAACCTGTGCAAG 525
QY 502 AATGTAATCTCTTTATTAAGATGCAATGCTCAAAAGTGTGTAACGCTGTAATGTTTC 561
DB 526 GATGCTGTCAAGCCCTCTCGGTTCCGATGTCCAGAGCGGTTGCTGCGGCGCCAGGCTAC 585
QY 562 ATGTGTAACAACAACAACCTTGGGCTGCTCAATGATGCTGCTTACGCTTGGCTGCT 621
DB 586 ATGTGCAATGACAACAAGCCCTGAGGTGTCAATGACGACTTGTGCTAGCGTTTGGCTGCT 645
QY 622 GCTCTATTTGCTGCTCCAAAGAGCTGATGATGTTGTGCTGTTATGAATGACCTTC 681

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Dd 646 GCCAGCTGGTAGGGCGGAGCCTCGACCTTCGCTGGGGCTTGAAGACCTTACCTTC
Qy 682 ACTTCGGGCGTCTTCTGGAAGAAGATGTTTCAAGTTACCAACACCGGAGCAT 741
Dd 706 ACCAACACGCTGCTGCGTCGACAGATTGTGTCTCCAGGTACCAACACCGGAGCAT 765
Qy 742 TTAGGCTCAACCTTGTATTTGCAAAATGCCGGGAGGAGTGTGATCTTCAATGCG 801
Dd 766 CTCAGACCAACCACTTTGATTGCAATGCCCCGGGGGAGTGTGCTTACTTCAAGCGC 825
Qy 802 TGTGCTGCTCAATGGGGGCGCTCCCAATGATGCTGGGGAGCTAGATATGTTGTTGACG 861
Dd 826 TGCAGCTCCAGCTGGAACACCAACCAAGATGCTGGGGGAGTGTGCTTATGCGGATTAAGC 885
Qy 862 TGTGCTGCTCAATGGGCTCTTCTCCCTGCTCTTCAAGCTGTTGTAATGAGATTC 921
Dd 886 TCTATTTCAGAGTGGACAGACCTTCTTACCCAGTTCAGGCTGGTTGCAAGTGAAGATTC 945
Qy 922 AACTGGTTCAAGAACTGTATTAACCTTACCATGACCTTCAAGAAAGTATCTGCTGCT 981
Dd 946 GATGGTTCAAGAACTGTATTAACCTTACCATGACCTTCAAGAAAGTATCTGCTGCTG 1005
Qy 982 GATTAACCTACTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1017
Dd 1006 GAGATCATTTGCCAAGACGTGTTGCGAGCGCAAGTAA 1041

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## RESULT 11

AAA62727 standard; DNA; 1101 BP.

AAA62727;

25-SEP-2000 (first entry)

Endoglucanase nucleotide sequence 2.

Endoglucanase; cellulose breakdown; produce pulp; papermaking;

animal foodstuff; ss.

Rhizopus oryzae.

WO200024879-A1.

04-MAY-2000.

25-OCT-1999; 99WO-JP05884.

23-OCT-1998; 98JP-0302387.

(MEIJ) MEIJI SEIKA KAISHA LTD.

Nakamura Y, Moriya T, Baba Y, Yanai K, Sumida N, Nishimura T,

Murashima K, Nakane A, Yaguchi T, Koga J, Murakami T, Kono T;

WPI; 2000-365117/31.

P-PSDB; AAB09822.

Endoglucanases of fungal origin with high activity under alkaline

conditions for production of paper pulp and animal feedstuffs

Claim 44; Page 108-110; 180pp; Japanese.

This sequence encodes an endoglucanase protein. The invention relates to an endoglucanase of fungal origin which can completely break down purified cellulose at a concentration of less than 1mg protein/litre, and produces more than 50% breakdown of cellulose at pH 8.5. The invention includes endoglucanase protein sequences (see AAB09825-B09830), endoglucanase nucleotide sequences (see AAA62726-A62733) and primers (AAA62733-A62802) which are used in the identification of the endoglucanase sequences, and in the construction of vectors containing the polynucleotides. The endoglucanase enzymes are

used for the production of pulp for papermaking and for the production of animal foodstuffs.

Sequence 1101 BP; 268 A; 258 C; 257 G; 318 T; 0 other;

Query Match 36.1%; Score 367.4; DB 21; Length 1101;

Best Local Similarity 70.9%; Pred. No. 6.8e-98;

Matches 520; Conservative 0; Mismatches 201; Indels 12; Gaps 2;

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Qy 297 AACCAAGACACTACCAAGACACTACCAAGACTAGCACTAGCTAGCTAGCTAGCTAGCT 356
Dd 369 AACCACTACTACCTAGCTAGCTAGCTAGCTAGCTAGCTAGCTAGCTAGCTAGCTAGCT 428
Qy 357 CACTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCTCT 416
Dd 429 TTCTAATCTTACGGGCAAAATATCTCAATGTTCTCTGTTGTTGTTGTTGTTGTTGTTGTT 488
Qy 417 AACTGTTATTTAGGATTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 476
Dd 489 TACTGTTATTTAGGATTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 548
Qy 477 TGTGCTGTTGACACTGTTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 533
Dd 549 TTCTCTCTCTCAAGCTCTGTAACCAAAATGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 608
Qy 534 AAGTGGTTGTAACGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 593
Dd 609 AAGTGGCTGTAACGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 668
Qy 594 TGAATGACTGCTTACGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 653
Dd 669 CCAATATCTTGTCTATGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 728
Qy 654 GGTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 713
Dd 729 GTCTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 788
Qy 714 TGTGTAAGTTACCAACACCGGTGCGATTAGCTC-----TAACCACTTTGATT 764
Dd 789 TATCCAAATCTAATCACTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 848
Qy 765 GCAAAATGCCCGGTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 824
Dd 849 GCAAAATGCCCGGTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 908
Qy 825 CAATGATGCTGGGAGACTAGATATGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 884
Dd 909 CAATGATGCTGGGAGACTAGATATGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 968
Qy 885 TCCCTGCTCTCTCAAGCTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 944
Dd 969 TCCCTGCTCTCTCAAGCTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTTGTT 1028
Qy 945 CCTTACCAATGACTTCAAGAACTTACCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1004
Dd 1029 CCTTACCAATGACTTCAAGAACTTACCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT 1088
Qy 1005 CGAAGAAAGTAA 1017
Dd 1089 TTCAGAAAGTAA 1101

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## RESULT 12

AAU43245 standard; DNA; 1101 BP.

AAU43245;

22-AUG-2002 (first entry)

Rhizopus arrhizus endoglucanase-related coding sequence 2.

Zygomycetes-originated endoglucanase; cellulose binding domain;



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QY 1 ATGAAGTTCACCGTTCCTATCTACTCAATCGCTGTTGACCTGCTGAGCTCT---TCT 57
DB 16 ATGAAGTTCACCTATGCTCTCTCTCGCCCTCTCTGCTGCTGCTGCTGCACTGAGT 75
QY 58 GCTAAGCTGCTCTCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 117
DB 76 GCTCGCGCGCTGAGTCTCTCAAGCTCTGAGAGAGTGGCGGAGAGAGAGAGAGAGAG 135
QY 118 CCTACCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 177
DB 136 CCGACCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 189
QY 178 CAATGCTCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 237
DB 190 CAGTGCCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 249
QY 238 TCTACCAAGACATCTACTACCAAGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 297
DB 250 ACGACG---GCTGCTCAAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAG 300
QY 298 ACCAAGACACTACCAAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAG 357
DB 301 ACCGCTCCGCTCAAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAG 360
QY 358 ACCTGCTCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 417
DB 361 AGCTGCTCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 420
QY 418 ACTGCTATGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 477
DB 421 ACCGCTACCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 480
QY 478 GCTGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 534
DB 481 TCGCTGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 540
QY 535 AGTGTGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 594
DB 541 TCGGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 600
QY 595 GATGAGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 654
DB 601 GACAACTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 660
QY 655 TGTGTGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 714
DB 661 TGTGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 720
QY 715 GTTCAAGTTCACCAAGCGAGTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 765
DB 721 GTTCAAGTTCACCAAGCGAGTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 780
QY 766 CAATGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 825
DB 781 CAGATGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 840
QY 826 AATGATGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 885
DB 841 AAGACGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 900
QY 886 CCTGCTGCTCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 945
DB 901 CCGAGCGCTCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 960
QY 946 CCTACCAAGACACTTACCAAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAG 1005
DB 961 CCGTCTGCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 1020
QY 1006 GAAAGAGAGTAA 1017
DB 1021 TCGGCGCAAGTAA 1032

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RESULT 14
AAL43250
ID AAL43250 standard; DNA, 1043 BP.
XX
AC AAL43250;
XX
DT 22-AUG-2002 (first entry)
XX
DB Rhizopus arrhizus endoglucanase-related codon-optimised DNA sequence.
XX
KM Zygomycetes-originated endoglucanase; cellulose binding domain;
XX fibre processing; waste paper de-linking; paper pulp; ds; gene.
OS
OS Rhizopus arrhizus.
OS Synthetic.
XX
FN MO200242474-A1.
XX
PD 30-MAY-2002.
XX
XX 21-NOV-2001; 2001MO-JP10188.
XX
PR 21-NOV-2000; 2000JP-0354296.
XX
XX (MEIU) MEIJI SEIKA KAISHA LTD.
XX
XX Nakane A, Baba Y, Koga J, Kubota H,
XX
XX WPI; 2002-471729/50.
XX
DR P-PSDB; AAO15052.
XX
PT Cellulose-binding domain-lacking Zygomycetes-originated endoglucanase,
PT with effect of endoglucanase activity enhanced in processing fibers,
PT deinking waste paper and improving freeness of paper pulp
XX
XX Example 10; Page 84-86; 109pp; Japanese.
XX
XX The invention comprises the amino acid and coding sequences of
XX zygomycetes-originated endoglucanase enzymes lacking the cellulose
XX binding domain. The zygomycetes-originated endoglucanase enzymes of the
XX invention have enhanced endoglucanase activity. The zygomycetes-
XX originated endoglucanase enzymes of the invention are useful for
XX processing fibres, de-linking waste paper and improving the freeness of
XX paper pulp - which is particularly applicable in detergent compositions.
XX The present DNA sequence represents an endoglucanase-related gene
XX sequence of the invention.
XX
S0 Sequence 1043 BP; 212 A; 370 C; 291 G; 170 T; 0 other;
Query Match 28.4%; Score 288.4; DB 24; Length 1043;
Best Local Similarity 58.7%; Pred. No. 1,4e-74;
Matches 606; Conservative 0; Mismatches 336; Indels 30; Gaps 5;
QY 1 ATGAAGTTCACCGTTCCTATCTACTCAATCGCTGTTGACCTGCTGAGCTCT---TCT 57
DB 16 ATGAAGTTCACCTATGCTCTCTCTCGCCCTCTCTGCTGCTGCTGCTGCACTGAGT 75
QY 58 GCTAAGCTGCTCTCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 117
DB 76 GCTCGCGCGCTGAGTCTCTCAAGCTCTGAGAGAGTGGCGGAGAGAGAGAGAGAGAG 135
QY 118 CCTACCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 177
DB 136 CCGACCTGCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 189
QY 178 CAATGCTCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 237
DB 190 CAGTGCCTGCTGCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 249
QY 238 TCTACCAAGACATCTACTACCAAGCTCTGCTCTGCTCTGCTCTGCTCTGCTCTGCT 297
DB 250 ACGACG---GCTGCTCAAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAGAG 300

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	Key	Location/Qualifiers
FF	FT	CDS
TT		/tag= a
		/product= "endoglucanase"
Qy	298	ACGAAGACAACTACCAAGACAACTACCAAGACTGACCTACTACTGCGCTGCTTCACTTCC 357
Db	301	ACCGCTCCCGCAAGAAAGACCAACGACGCTCGGCGCAAGGCTTGACATCCGCTCACTCGACG 360
Qy	358	ACCTCTTCTTCGCTGTGTTACAAAGGTCACTCTGCGCGGTAAATCTGGCAGTGCTTCCACA 417
Db	361	AGCTGCTTTCGGGAAAGTACAGGCGCTGTCAAGCGGTGGCGGTAGCGGCAACGGCGTCACT 420
Qy	418	ACTGTTAATTGGGATGTGTTAAAGCTTCTTGACGCTGCGCTTGAAAAAGCTTCTGTCACT 477
Db	421	ACCGGCTACTGGGACTGTGCAAGGCTTCTGCTGCGGCCCGCAAGGCTTAAGGTCAAGC 480
Qy	478	GGTCTGTGTGACACTGTGACCTGACCAATG---TATCTTTAATTAGATGCCAATGCTCAA 534
Db	481	TGCGCTGTCAAGTCTCTGCACAAAGAGCGGCGCTCAACCGCTCTTAAGGATCTCAAGCGCAG 540
Qy	535	AGTGATTGTAAACGGTGTAAATGATTCAATGTGTAAACAACAACCACTTGGGCTGTCAAT 594
Db	541	TCCGGCTGTCAACGGGCGGCACTCCCTACATGTGTCAACGACAACTGAGCATGGGCTGTCAAC 600
Qy	595	GATBAGCTCGCTTAACGTTTTGCTGCTGCTCTCTATGCTGGCTCCAAACGAAGCTGGAATG 654
Db	601	GACAACTCTTGCTTACGTTTGCTGCTGCGCTGCCATTAACGGGCGGTGGGAAGCGCTGG 660
Qy	655	TGTTGTGGCTGTATGAATGACCTTCACTTCTGGCGCTGCTTCTGAAAAGAGATGTT 714
Db	661	TGCTGCTGCTGCTCTGAGCTCACTTCACTTCAACGAGCTTGCTGGCAAGAAATGATC 720
Qy	715	GTTCAAGTTACCAACCGGTGGCGATTAGG-----CTCTAACCACTTGTGATTTG 765
Db	721	GTCCAGGTCAACCAACTGGCGGTGACCTTGGCAGCTGACCGGATGCCCACTTGCATCTC 780
Qy	766	CAATGCCCGGGTGGGTGTGTATCTTCAATGGCTGTGCTCAATGGGGCGCTCC 825
Db	781	CAGATGCCCGGCGGGCGGTGGCACTTCAACGATCTGTCTCCAGATGGGGCGCTCC 840
Qy	826	AATGATGGCTGGGAGCTAGATATGATGATGTGTCAGCTCTGTCCTGATGCTGCTCTT 885
Db	841	AAGACGGCTGGGGCTGGCGCTACGGGGGCAATCAGCTCGGCAGCGAATGCTCTGCTCC 900
Qy	886	CCCTCTGCTCTTCAAGCTGTTGTAAATGAGATTCAACTGGTTCAAGAACTCTGATTAAC 945
Db	901	CCGAGCGCTCTCCAGGCGGGCTGCAAGTGGCGCTTCAACTGGTTCAAGAAACGCCGCAAC 960
Qy	946	CCTACCAATGACCTTCAAGAGATTACCGTCTGTGTAATTAACTACTCGCTCAAGTTC 1005
Db	961	CGGTCCAGACTTCAAGAGAGTCACTGCGCCCAAGAGATCAACGCTAAGACGGAGTGC 1020
Qy	1006	GAAGAAAGTAA 1017
Db	1021	TCCGCGCAAGTAA 1032
RESULT 15		
AAV16105		
ID AAV16105 standard, cDNA, 984 BP.		
XX	AAV16105;	
AC	AAV16105;	
XX	21-JUL-1998 (first entry)	
DT		
XX	Fusarium oxysporum non-surface-active endoglucanase gene.	
DE		
XX		
KM	endoglucanase; non-surface-active; cellulase; detergent; cleaning;	
XX	performance; strain removal; soften; feel; colour; ss.	
XX	Fusarium oxysporum.	
OS		
XX		
FF	Key	Location/Qualifiers
FT	97..735	
CDS	/tag= a	
TT	/product= "endoglucanase"	

XX	MO9804663-A1.
XX	05-FEB-1998.
XX	25-JUL-1997; 97WO-US13194.
XX	30-JUL-1996; 96US-0023125.
XX	(PROC ) PROCTER & GAMBLE CO.
XX	Boyer SL;
XX	WPI: 1998-130664/12.
XX	P-PDSB; AAM46619.
PT	Detergent composition containing both surface-active and non-surface
PT	active cellulase - softens and improves feel of cotton fabrics
PT	without causing loss in weight or tensile strength
XX	Disclosure; Pages 54-56; 68pp; English.
XX	The sequence is that encoding the endoglucanase enzyme of a non
CC	surface-active cellulase produced by Fusarium. The enzyme can be
CC	used in a detergent composition with a surface-active
CC	cellulase. This combination improves cleaning performance
CC	(maintains colours and removes stains), and softens and
CC	improves the feel of cotton fabrics without causing losses in
CC	weight or tensile strength.
XX	Sequence 984 BP; 229 A; 270 C; 227 G; 258 T; 0 other;
SQ	
Query Match	21.8%; Score 221.4; DB 19; Length 984;
Best Local Similarity	63.9%; Pred. No. 8.2e-55;
Matches 371; Conservative	0; Mismatches 201; Indels 9; Gaps 2.
OY	400 TCCTGCAAGGTGGTTCACAACTCGTTATTGGGATTTGGTAAAGCTTCCTGCAGCTGCCCT 459
Db	151 TCTGGAAGCGGTCACTACTCATCTGATCGATCGGATTTGGCAAGCCTTCCTTGCTTGAGNC 210
OY	460 GGAAGAAGCTTGTGTACATGAGTGTCTGTTGACACCTGTGCTCCAATGATNCTCTTATTA 519
Db	211 GGAAAGCTGTGTTCACAAGCCCCCTGTCTTAATCTGTATAAGAACGAACCCTATTC 270
OY	520 GATGCCAATGCTCAAAGTGGTTGTA--CGGTGTAATGTTTTGATGATGAACAAC 576
Db	271 AACACCAATGTGTTCACAAGGTTGAGGGGTGTGGTCTGTATGCTTGACCAACAATAC 330
OY	577 CAACCTTGGGCTGTCAATGATGAGCTGCTTACGGTTTCGCTGCTGCTCTATTTGCTGGC 636
Db	331 TCCTCCCTGGGTGTTCACAAGATGAGACTTGCCTACCGTTTCGTGTACCAAGATCTCCGGT 390
OY	637 TCACAAGAGCTGATGGTGTGTGAGGCTGTATGAATTGACCTTCACTTCGGGCGTGT 696
Db	391 GGCTCCGAGGCGACCTGGTGTGTGCTGTCTGTATGCTTTGACCTTCAACCACTGGCCGCTC 450
OY	697 TCTGAAAAGAGATGATGTTGTTCAAGTTACCAACACCGGTGGCGAATTTAG3CTTAAACAC 756
Db	451 AAGGGAAGAAAGATGATGTGTCAAGTCCACCAACACTGGAAGGTGATCTGGGGAACAACAC 510
OY	757 TTGTGATTTGCAATATGCCCGGTGTGTGGCTGTGTATCTTCAATGGCTGTGTGCTCAATGG 816
Db	511 TTCATGTCATGATGATGCCCGGCGGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 570
OY	817 GGCGCTCCCAATGATGATGGCTGGGAGCTGATGATGATGATGATGATGATGATGATGATGATG 876
Db	571 GG-----CAAGGCTCTGGCGGT 624
OY	877 GCCTCTCTCTTCCCTGTGCTTTCAAGCTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGTGT 936
Db	625 GATAGCTACCCCGAGCTTCTCTGAAGAGCGTTGGCCACTGGCGATTCGATGTGTTGAGAAC 684
OY	937 TCTGATAACCTTACCATGATCCTTGAAGAGATTAACCTGTCC 977

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Page 14

Db 685 GCCGACAACTTGAAGCGAGTTGAGTGGCC 725

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